W18As

bi-amped, active
loudspeaker system

instruction manual

Montarbo

The lighting flash with arrowhead symbol within an equilateral triangle, is intended to alert the user to the presence of uninsulated 'dangerous voltage' within the product's enclosure, that may be of sufficient magnitude to constitute a risk of electric shock to humans.

The exclamation point within an equilateral triangle, is intended to alert the user to the presence of important operating and maintenance (servicing) instructions.

IMPORTANT ! **SAFETY INSTRUCTIONS**

WARNING
In order to protect your own and others' safety and to avoid invalidation of the warranty of this product, please read this section carefully before operating this product.

- This product has been designed and manufactured for being operated as active speaker system in the applications tipical of a sound reinforcement system or of a sound recording system. Operation for purposes and in applications other than these has not been covered by the manufacturer in the design of the product, and is therefore to be undertaken at end user's and/or installer's sole risk and responsability.
- This unit conforms to Class 1 insulation, and for safe use it is required that the protective earth contact is connected to a grounded (earthed) outlet.

TO AVOID THE RISK OF FIRE AND/OR ELECTRIC SHOCK:

• Never expose this product to rain or moisture, never use it in proximity of water or on a wet surface. Never let any liquid, as well as any object, enter the product. In case, immediately disconnect it from the mains supply and refer to servicing before operating it again. Never place burning candles or other sources of open flame on top of the device.

• Before connecting this product to the mains supply, always make sure that the voltage on the mains outlet corresponds to that stated on the product.

• This product must be connected only to a grounded mains outlet complying to the safety regulations in force via the supplied power cable.
In case the power cable needs to be substituted, use exclusively a cable of the same type and characteristics.

• This device is connected to the power line even when the mains switch is in the O (off) position and the power indicator is off. As long as it is plugged in there are dangerous electrical potentials inside the device, so, before undertaking any sort of maintenance work etc., always make sure it has been unplugged from the mains socket.

• Never place any object on the power cable. Never lay the power cable on a walkway where one could trip over it. Never press or pinch it.

• Never install the product without providing adequate airflow to cool it.
Never obstruct the air intake openings on it. Leave enough room to get to the mains power socket and the mains connector on the back panel.

• In case the external fuse needs replacement, substitute it only with one of the same type and rating, as stated on the product.

• Always make sure the Power switch is in its '0' (= off) position before doing any operation on the connections of the product.

• Before attempting to move the product after it has been installed, remove all the connections.

• To disconnect the power cable of this product from the mains supply never pull the cable directly. Hold the body of the plug firmly and pull it gently from the mains supply outlet.

CAUTION!
This product does not contain user serviceable parts.
To prevent fire and/or electrical shock, never disassemble it or remove the rear panel. For maintenance and servicing always refer to the official Montarbo Distributor in your Country or to qualified personnel specifically authorised by the Distributor.

Before placing the product on a surface of any kind, make sure that its shape and load rating safely match the product size and weight.
Never attempt to hang the product by any means not expressly provided or approved by the manufacturer (i.e. ropes, chains, belts or whatever medium, throgh carring handles, bolts, hooks or whatever). In case the product is factory-fitted with specific mounting hardware, always verify before installation that the lifting and/or hanging system you intend to use is of a proper type and can carry the product weight with the safety ratio required by the regulations in force.

- To avoid shocks, kicks, or whatever action, always reserve a protected area with no access to unqualified personnel as installation site of the product. In case the product is used near children and animals closest supervision is necessary.

- This product can generate very high acoustic pressures which are dangerous for the hearing system. Always avoid operation at loud levels if anyone is excessively near to the product (at least 1 m of distance).

☛ *Never expose children to high sound sources.*

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PACKAGE CONTENTS

- Bi-amplified active system W18As
- Power supply cable
- XLR to XLR cable (for connection to the mixer)
- Owner's manual
- Warranty certificate
- CE declaration of conformity

Waste from Electrical and Electronic Equipment

Attention !
The crossed out wheeled bin symbol that can be found on this product means that the product is covered by the Waste from Electrical and Electronic Equipment Directive. The symbol is intended to indicate that waste from electrical and electronic equipment must be subject to a selective collection.

For more details on available collection facilities please contact your local government office or the retailer where you purchased this product.
The solid bar underneath indicates that the product has been put on the market after 13th August 2005.

INFORMATION ON PROPER DISPOSAL

Information on Disposal for Users (private households)

In the European Union Attention: If you want to dispose of this equipment, please do not use the ordinary dust bin! Used electrical and electronic equipment should not be disposed of via the normal household waste stream but must be treated separately and in accordance with legislation that requires proper treatment, recovery and recycling of used electrical and electronic equipment. Following the implementation by member states, private households within the EU states may return their used electrical and electronic equipment to designated collection facilities free of charge*.
In some countries* your local retailer may also take back your old product free of charge if you purchase a similar new one. * Please contact your local authority for further details.
In other Countries outside the EU: If you wish to dispose of this product, please contact your local authorities and ask for the correct method of disposal.
In Switzerland: Used electrical or electronic equipment can be returned free of charge to the dealer, even if you don't purchase a new product. Further collection facilities are listed on the homepage of www.swico.ch or www.sens.ch.

Information on Disposal for Professional Users

In the European Union If the product is used for business purposes and you want to discard it: please contact your Montarbo dealer who will inform you about the take-back of the product. You might be charged for the costs arising from take-back and recycling. Small products (and small amounts) might be taken back by your local collection facilities.
In Spain: Please contact the established collection system or your local authority for takeback of your used products.
In other Countries outside the EU: please contact your local authorities and ask for the correct method of disposal.

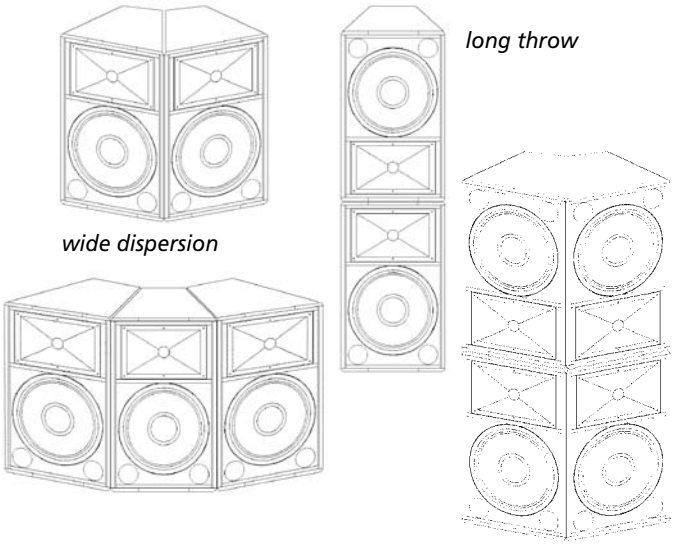
Introduction

The 2-way bass reflex enclosure incorporates:

- custom designed, high quality components.
- 2 amplifiers:
600 + 250 W continuous
850 + 350 W peak
- 2 independent processors
- 24dB/Oct electronic crossover

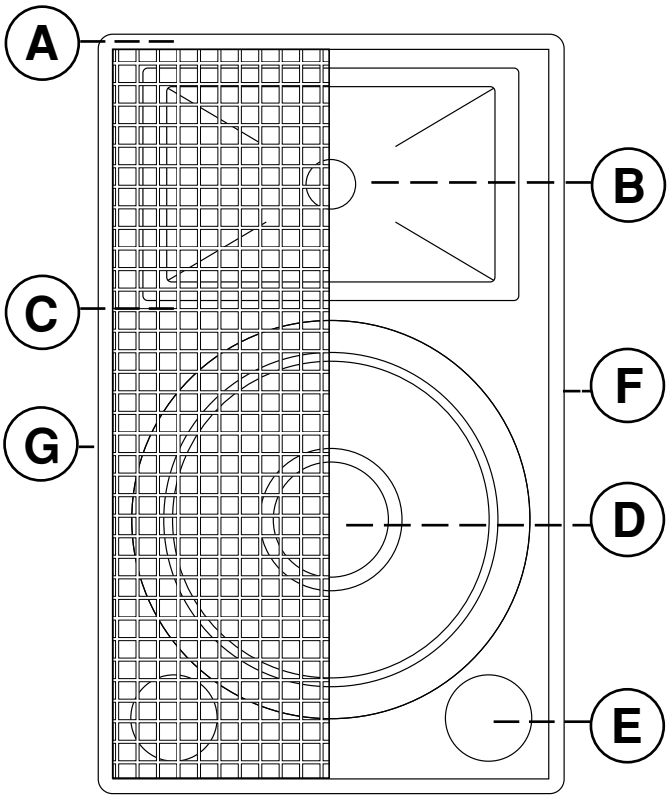
The bass reflex enclosure, constructed from birch plywood, is equipped with a custom designed 18" low frequency woofer and a 2" driver with constant directivity horn for the mid/high frequencies, each driven by its own dedicated power amplifier. A high slope 24dB/Oct. electronic crossover and two processors (one for each amplifier) optimize the dynamic range and frequency response of the system, while protecting the drivers from thermal and electrical overloads, resulting in increased reliability and outstanding performance.
Its adaptability to various applications allows the W18As to be used in any type of installation ensuring optimum results to any professional requirement for sound reinforcement and distribution.

The trapezoidal enclosure design is based on solid technical reasons:
• directivity remains constant and controlled, even when two or more enclosures are installed side by side.
• the problems related to interferences and irregularities in frequency response and directivity, typically encountered when using multiple enclosures, are thus dramatically reduced.
Multiple enclosures arrays can be assembled for wide dispersion and/or long throw.



long throw / wide dispersion

Description



A High grade birch plywood construction, phenolic glued; polyurethane painted

B Constant directivity, high frequency horn (dispersion 90° x 60°) with 2" dynamic driver (featuring aluminum flat wire voice coil, kapton former, titanium dome)

C Powder coated, perforated, steel grid.

D 18" high efficiency woofer

E Tunig ports

F Side recessed handles

G Control and connection panel

Construction and components conform to the highest professional standards for maximum reliability.

Control and connection panel

1 The W18As speaker system is equipped with XLR male (OUT) and female (IN) parallel connected sockets allowing easier daisy-chaining.
- Mixer output ➔ W18As input ('IN' socket)
- W18As output ('OUT' socket) ➔ input ('IN' socket) of the W18As to be connected in parallel.

☛ *See 'connectors' and 'connection examples' at pages **9** and **10**.*

2 Main volume (VOL). Adjusts the input levels of the two built-in power amplifiers to adapt them to the output level of the mixer.

3 High frequencies level control (H.F.).

NOTE: if you are using a Montarbo mixer (or any mixer having an output level of 0dB) for optimum performance it is advisable to set both controls fully clockwise (to their maximum settings).

4 POWER / 0 - I: Mains power on/off switch.

5 Mains power cord socket (with built-in fuse). Use only the factory supplied mains cable or a suitable cable with a ground connection and marked with the safety approvals valid in the country of use. When installing make sure that it is easy to get to this connector and to the mains plug.

6 Thermostatically controlled low turbolence fan. ***NOTE***: in order to reduce noise and dust build-up, the thermostatically controlled fan is not activated unless the amplifier heats up to a pre-set level, and it turns off automatically when the temperature drops back down below this level.

Important !

Product care and maintenance

• This product has been designed for use in tropical climates and particularly warm weather conditions.

• Never place burning candles or other sources of open flame on top of the device.

• Never expose the enclosure to heat sources (heaters or other products that produce heat).

• Never expose the enclosure to direct sunlight, excessive vibrations or mechanical shocks.

• Avoid operating and storing the enclosure in damp or dusty places: this may lead to malfunctions and premature degrading of specifications.

• Avoid using the enclosure close to strong sources of electromagnetic interferences (e.g. video monitors, high power electrical cabling). This may lead to degradation of audio quality.

• When setting up the system up outdoors, be sure to protect it against rain.

• Care should be taken so that objects do not fall and liquid is not spilled onto the enclosure. In public event don't let people, musicians, technicians or anyone put glasses, cups, ashtrays or cigarettes on the enclosure.

• Always leave the protective grid mounted on the enclosure.

• Use a soft brush or a jet of air to clean the enclosure.
Do not use alcohol, solvents or detergents.

• Take care of your connector cables. Make sure that they are not damaged, knotted or twisted.

• Do not force connectors and controls.

• Make sure the mains power switch is off ('0') before starting any connection.

• As long as it is plugged in there can be dangerous electrical potentials inside the device, so, before undertaking any sort of maintenance work etc., always make sure it has been unplugged from the mains socket.

Mains power connection

• Make sure the mains power switch is off ('0').

• Check that mains voltage corresponds to the voltage indicated on the panel, under the mains socket.

• Use only the factory supplied mains cable or, if a different plug style is needed, a suitable cable with a ground connection and marked with the safety approvals valid in the country of use.

• Leave enough room to get to the mains power socket and the mains connector on the back panel.
As long as it is plugged in there can be dangerous electrical potentials inside the device, even when the mains switch is in the '0' (off) position and the power indicator is off so, before undertaking any sort of maintenance work etc., always make sure it has been unplugged from the mains socket.

Connection to the mixer

If the mixer has XLR balanced outputs: use standard balanced XLR connectors.

If the mixer has XLR unbalanced outputs: in this case, unless using a Montarbo mixer, make sure that the XLR outputs on the mixer are unbalanced to IEC 268 standard: 1 = GND, 2 = HOT, 3 = GND.

If the mixer has JACK balanced outputs (stereo jacks): it is possible to use stereo jack-XLR adapters, wired according to IEC 268:
pin 1 = ground (sleeve), pin 2 = tip, pin 3 = ring.

If the mixer has JACK unbalanced outputs (mono jacks):
use suitable Jack-XLR male adapters unbalanced according to IEC 268:
pin 1 = ground, pin 2 = tip, pin 3 = ground

☛ *See 'connectors' at page **7**.*

• Always use only heavy gauge, high quality SHIELDED cables (signal cables).

• Always make sure that the mixer and the powered enclosures are switched off before connecting them. This will to avoid annoying noises and signal peaks, which can also be dangerous for the enclosures themselves.

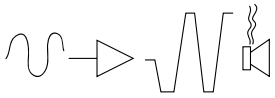
Parallel connection of two or more systems

• Always use only heavy gauge, high quality SHIELDED cables (signal cables). Connect the LINK OUT socket of the first system to the LINK IN socket the second system and the LINK OUT of the second system to the LINK IN of the third, and so on.

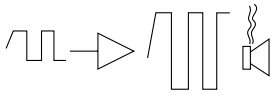
☛ *See 'connection example' at page **7**.*

Input sensitivity and clipping. How to avoid clipping

Every amplified speaker system is characterized by a value of input sensitivity. The sensitivity is defined as the value of the amplifier's input signal that will result in maximum power output. An increase in input signal over that threshold will result, not in increased power, but in a distortion phenomenon called 'clipping' (output stage saturation).



In this condition, the speaker will operate improperly. The diaphragm will exceed it's excursion limits, and the voice coil will overheat beyond it's thermal limits, resulting in overheating and premature failure.
The active processors will help in avoiding clipping, by reducing the amplifier gain and thus the input sensitivity, but this type of protections may be overridden in very extreme conditions.
What the active processor cannot modify is a signal that is distorted before getting to the active speaker's input.



The effects of this type of signal are the same as described above.

How to avoid clipping
The simplest way to avoid clipping is to check each level in the signal's chain. Start from each input channel of the mixer and adjust the gain control and the equalizer's controls so that the PFL meter will never (or only occasionally) indicate more than 0dB. In simpler mixers, check that the 'clip' or 'peak' indicator is always off, or blinks only occasionally.
If these levels are exceeded, reduce the channel's input gain.
Once the desired mix is obtained, adjust the output level so that it never exceeds the active speaker's or the power amplifier's input sensitivity, as displayed on the master output VU-meter.
In model W18As the input sensitivity is 0dB.

Specifications

Speaker system — *2-way bass reflex*

• Components: custom designed to Montarbo specs

- bass frequencies — 18" high efficiency woofer

Nominal diameter	18"
Frequancy range	32÷2000Hz
Power capacity	600W
Sensitivity	101dB
Rated impedance	4 Ohms
Net weight	13,5 Kg
TThiele & Small Parameters	
fs	32Hz
Re	2,8 Ohms
Qms	5,45
Qes	0,31
Qts	0,293
Vas	0,376m^3
ho	3,85%
B.l	19,8T/m
SD	0,104m^2
Xmax	0,0099m
Pe	600W r.m.s.

- mid/high frequencies — 2" driver coupled with a constant directivity horn

Exponential horn	
Nominal coverage	(H x V) 90° x 60°
Cutoff frequency	500 Hz
Throat diameter	50 mm
Material	aluminium fusion
Dimensions	435x270x230 mm
Net weight	3 Kg
Driver	
Throat diameter	50 mm
Nominal impedance	8 ohms
D.C resistance	6,2 ohms
Power capacity	180 Watt RMS
Sensitivity	108 dB
Frequency range	500 ÷ 20kHz
Voice coil diameter	74,5 mm
winding material	aluminum flat wire
former material	kapton
Dome material	titanium
Inductance	0,17 mH
Flux density	1,95 T
Overall diameter	165 mm
Depth	70mm
Net weight	4,8 kg

• Impedance — 4 ohm (bass) / 8 ohm (mid/high)

• Frequency response — 40Hz ÷ 20kHz
- bass: 40Hz ÷ 800Hz
- mid/high: 800Hz ÷ 20kHz

• Sensitivity (1W / 1m) — 101 dB SPL

• Max SPL — 131 dB

Built-in electronic crossover:

• crossover frequency — 800Hz

• slope — 24dB/Oct

Built-in power amplifiers — 2 MOSFET (class AB); 2 independent processors

• Max. output power — **850 W continuous / 1200 W peak**

- bass — 600 W continuous (4 ohms @ 0,1%THD); 850 W peak

- mid-high — 250 W continuous (8 ohms @ 0,1%THD); 350 W peak

Forced cooling, thermostatically controlled low turbolence fan

• Frequency response — 35Hz ÷ 25kHz +0/-1dB

• Input impedance — 10KOhms (balanced)

• Input sensitivity — 0dB (775 mV)

• Noise referred to input — - 108dB (A weighted)

• Power supply — **220 V.A.C. 50÷60 Hz / Fuse: F 6,3AL**
on request 117 V.A.C. 50÷60Hz / Fuse: F10AL

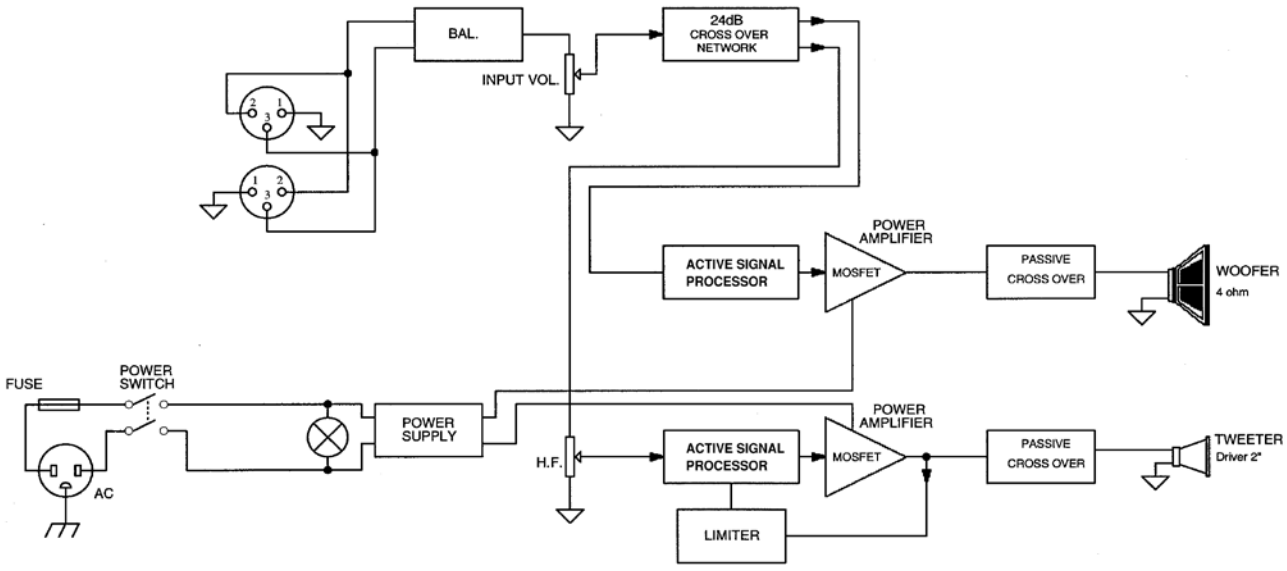
Connections — Balanced male (OUT) and female (IN) XLR inputs wired in parallel

Construction and finish — Phenyl-glued multiply birch Polyurethane paint

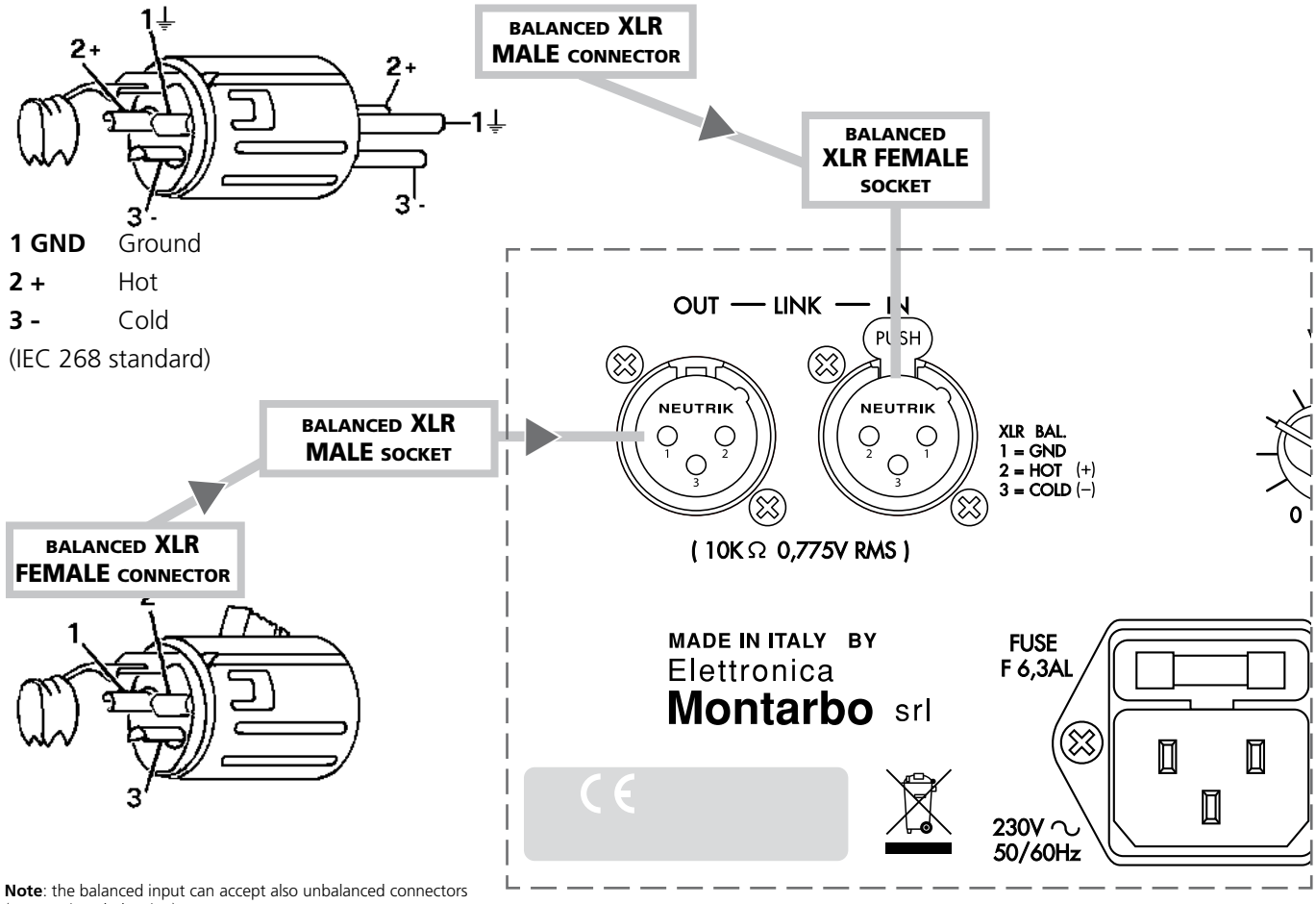
Dimensions (w x h x d) — 54 x 87 x 45 cm

Weight — 55,7 Kg

Block diagram



Connectors



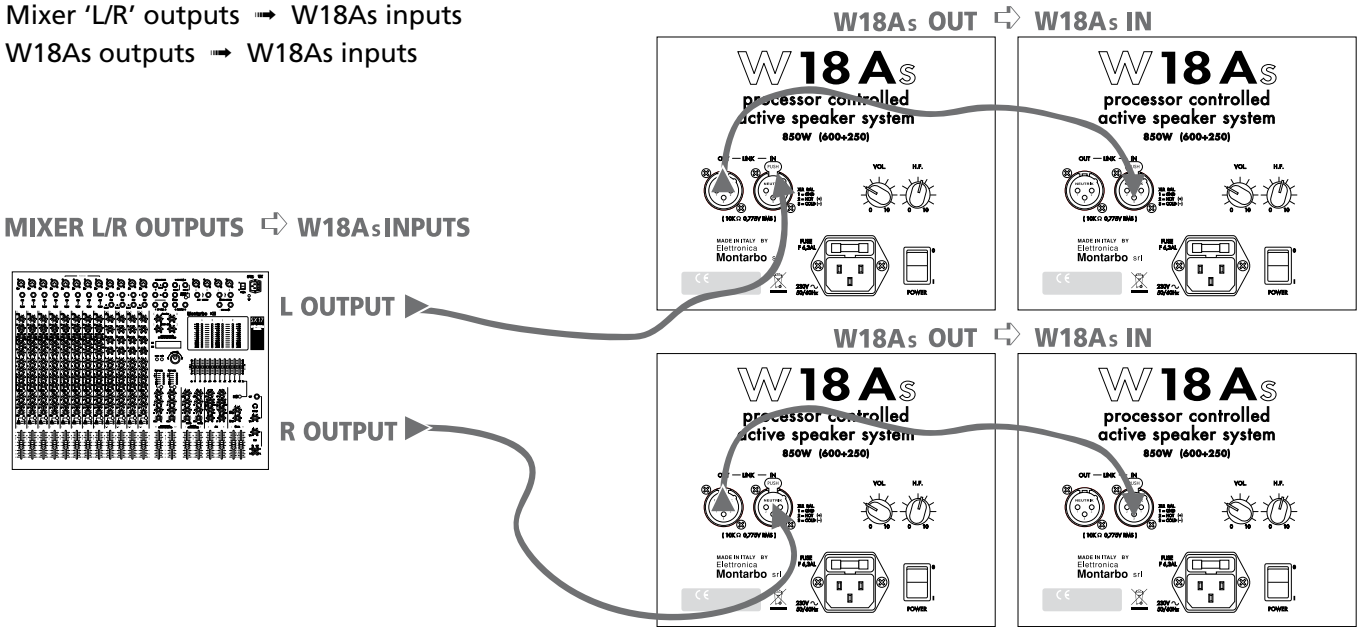
1 GND Ground
2 + Hot
3 - Cold
(IEC 268 standard)

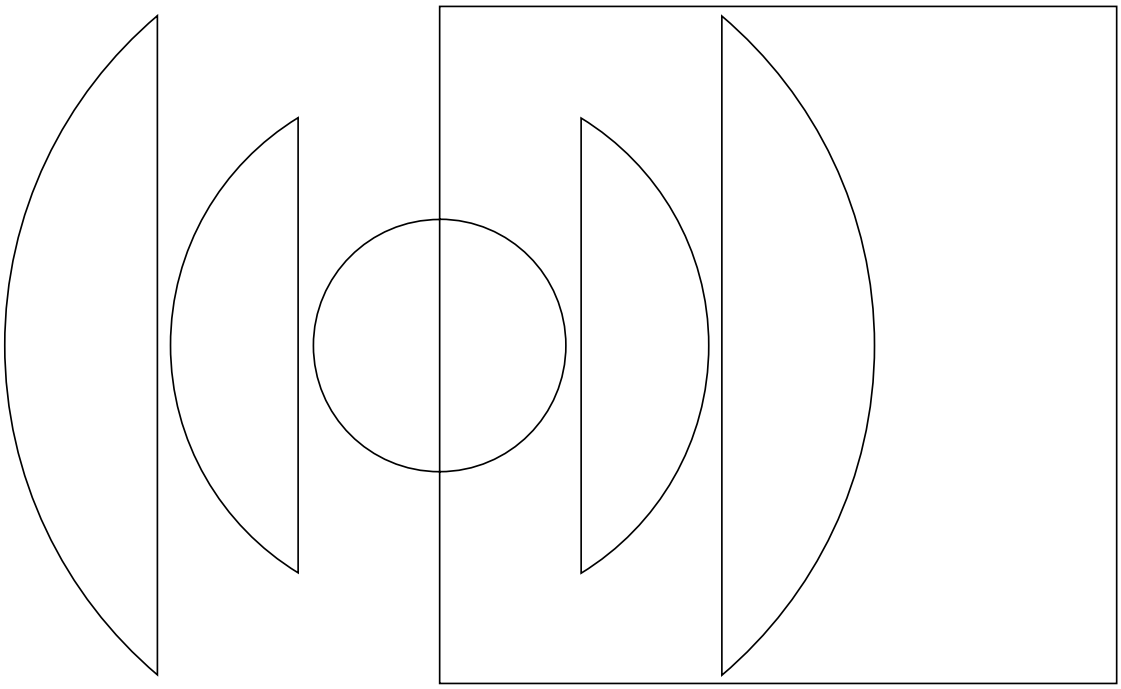
Note: the balanced input can accept also unbalanced connectors (automatic unbalancing)

Connection example

W18As parellel connection

Mixer 'L/R' outputs ➟ W18As inputs
W18As outputs ➟ W18As inputs





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The information contained in this manual has been carefully drawn up and checked. However no responsibility will be assumed for any inexactitude.
This manual can not cover all the possible contingencies which may arise during installation and use of the product. Should further information be desired, please contact us or our local distributor.

Elettronica Montarbo srl can not be considered responsible for damages which may be caused to people and things when using this product.

SPECIFICATIONS AND FEATURES ARE SUBJECT TO CHANGE WITHOUT PRIOR NOTICE.

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